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ABSTRACT

A complete course, curriculum, and textbook were developed to teach college level "study skills" using an educational, psychology-based strategies-for-achievement (stACH) approach. The approach involved teaching students four major achievement strategies: (1) taking reasonable risk; (2) taking responsibility for outcomes; (3) searching the environment (for information); and (4) using feedback. Each of these was divided into two substrategies based on more specific study needs. The course was originally taught in classrooms, and then was converted to a technology-based instructional modal called Active Discovery and Participation through Technology (ADAPT). The effectiveness of the course in terms of increasing student grade point average (GPA) was demonstrated in both settings. GPA increased in the term in which the course was taken for 92 students in the traditional classroom setting. A comparison of 37 students taking the course in the technology setting with 37 students not taking the course yielded significant differences in GPA in favor of course takers, especially among African Americans. (Contains 2 tables and 25 references.) (SLD)

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# The Strategies-for-Achievement Approach (stACH) for Teaching "Study Skills"*

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ABSTRACT

A complete course, curriculum, and textbook were developed to teach college level "study skills" using an educational psychology based strategies-for-achievement (stACH) approach. The approach involved teaching students four major achievement strategies: taking reasonable risk, taking responsibility for outcomes, searching the environment (for information), and using feedback, each of which was divided into two substrategies, to apply to overcoming procrastination, building self-confidence, learning from lecture and text, preparing for exams, writing papers, managing one's life, building relationships, and preparing for one's future. The course was taught originally in classrooms, and then converted to a technology-based instructional model called Active Discovery And Participation thru Technology (ADAPT). Evaluation of the effectiveness of the course in terms of increasing student GPA was demonstrated in both settings. A comparison of students taking the course in the technology setting to those not taking the course yielded significant differences in GPA in favor of course takers, especially among African-Americans.

"Study skills" is the term often applied to the cognitive and metacognitive strategies considered essential to being successful in college. Their importance is underscored by the fact that academic tasks at the college level tend to demand far more higher-level thinking and independent learning than those encountered in secondary school (Carson, Chase, Gibson, and Hargove, 1992). However, many of the materials used for teaching these "skills" have no essential theoretical base, hence no unifying theme or approach. They are a potpourri of admonitions and exercises amassed by those on the firing line, and passed down from colleague to colleague. While much of what they say may have validity, their lack of a coherent set of principles may make it difficult for students to remember and use the information to which they have been exposed.

However, a relevant general approach to teaching learning strategies, labeled "learning-to-learn" has its basis in informational and generative models of learning, and its emphasis on self-regulated and strategic learning (Simpson, Hynd, Nist, and Burrell, 1997). Building on this, and on other work, such as that by Pintrich, McKeachie, and Lin, 1987; Weinstein and Underwood, 1985; and Dansereau, McDonald, Holley, Garland, Diekhoff, and Evans, 1979, the work described here features a more well-integrated and focused approach, using a set of specific strategies and substrategies to cover a variety of learning and motivation tasks.

The purpose of this paper is to: (1) introduce and describe the Strategies-for-Achievement approach for teaching "study skills," (2) report students' judgments of the value of the study strategies instruction, and (3) provide data for evaluating the impact of being taught study skills on the grade point averages of the students taught.

The Strategies-for-Achievement approach (stACH) evolved from the achievement motivation model espoused by David McClelland in the '60's (McClelland, 1965), expanded and updated in its application to include both social-cognitive theory (Bandura, 1977, 1997; Weiner, 1995) and schema theory (Anderson, 1995). It is considered an educational psychology approach since it represents psychological theories applied to solving an educational problem, namely improving student achievement in college.

The four basic strategies for achievement used in the current approach are as follows: (1) take moderate risk, (2) take responsibility for your outcomes, (3) search the environment, and (4) use feedback. Prior work suggests that the use of these strategies such as these increases learners' motivation and subsequent achievement (McClelland, 1979). For purposes of instruction, each strategy has been subdivided into two substrategies and used as the basis for a course aimed at teaching college students to overcome procrastination, build self-confidence, become more responsible, manage their lives, learn from lectures and text, prepare for tests, write papers, build relationships, and examine careers.

The substrategies that accompany each strategy are listed below.

**Take Reasonable Risk** – the empowering strategy

- set goals that are challenging but attainable (GO FOR GOAL)
- break tasks down into small, manageable steps (BITE SIZE PIECES)

**Take Responsibility for Your Outcomes** - the belief strategy

- believe in your own effort and capability (THINK POSITIVE)
- build a plan (PLAN!)

**Search the Environment** – the action strategy

- ask questions (JUST ASK)

- build models (VISUALIZE IT)

**Use Feedback** – the reaction strategy

- monitor your actions (KEEP TRACK)
- give yourself instructions (TELL YOURSELF)

In support of the proposed approach, current theory and research in educational psychology that has directly addressed the issue of increasing student achievement in school is relevant. Garcia and Pintrich (1994) offer a framework for self-regulation at the college level that includes both a motivational and cognitive component, and two sources of influence: knowledge and beliefs, and strategies. In terms of motivation, Bandura (1997), for example, has identified ways people can be the agents of their own self-regulation and success, based on the beliefs they have in their own capability. Zimmerman (1998) has presented a conceptualization of academic studying in terms of underlying dimensions that students can self-regulate, and Tuckman (1992, 1996, 1997) has demonstrated a method for increasing students' motivation to engage in academic tasks such as studying, and to use self-regulation strategies as an aid to academic productivity. Graham (1997) has developed an approach for changing students' perceptions of the intentionality of others' actions.

With respect to a cognitive component of self-regulation, for example, Pressley et al. (1995) have described techniques for teaching students to use cognitive strategies, and Mayer (1989) has shown the value of conceptual models for visualizing ways of solving problems. Robinson, as far back as1961, and Mayer (1984) relied extensively on the question-asking approach in teaching students to extract meaning from text, and Rosenshine, Meister, and Chapman (1996) reported a meta-analysis showing that teaching students to generate questions resulted in gains in comprehension. Other recent work has also focused on enhancing students'

capability to learn from text (e.g., Tuckman, 1993). Clearly then, educational psychology provides a basis for generating materials and techniques that are likely to improve students' learning and motivation.

The application of research and theory has resulted in a course and curriculum designed for guiding students toward school success. Four motivation topics are covered in the course: (1) procrastination, (2) self-confidence, (3) responsibility, and (4) life management. These build on Bandura's (1977) concept of reciprocal determinism, Weiner's (1986) concept of causal attribution, and McClelland's (1965) risk management and personal responsibility strategies as ways of enhancing self-regulation. For example, in the module on procrastination, students are taught to: (a) distinguish between rationalizations (e.g, "I work better under pressure") and real reasons (e.g., self-doubt) for procrastination; (b) recognize the thoughts (e.g., "math confuses me"), feelings (e.g., fear) and behaviors (e.g., skipping class) that are provoked by potentially difficult situation situations (e.g., an impending math midterm); (c) overcome the tendency to procrastinate by using the four major strategies for achievement previously described; and (d) effectively manage their time by creating a "to-do checklist."

In addition, four cognitive skill topics are covered: (1) learning from lectures, (2) learning from text, (3) preparing for exams, and (4) preparing speeches and papers. These topics focus on using the search and feedback strategies, with particular focus on asking questions and building models as schematizing techniques. For example, students are taught to view information that is either heard in lectures or read in text as "answers" to implicit questions. By making those questions explicit through the construction of a "Q & A Outline," students learn both to schematize the information and organize it into visual forms such as diagrams and charts. The

diagrams and charts then help students organize their thoughts in preparing for and taking tests, and in writing papers.

What is the likelihood that being taught study skills will enhance school performance? Regarding near transfer resulting from what Hattie, Biggs, and Purdie (1996) classify as relational interventions, that is, ones of a broad, programmatic nature, the likelihood is high. Huang (1992), for example, found the effects of teaching students to use self-questioning strategies, one of the basic ones used in the stACH model, to be highly successful (effect size=0.58). Overall, Hattie, Biggs, and Purdie (1996) report similar success in near transfer across a wide range of such studies, but considerably less success in producing far transfer.

## STUDY ONE

### Methods

The stACH approach described above was used to teach seven sections of a 5-credit university course called "Individual Learning and Motivation: Strategies for Success in College" during the Winter and Spring Quarters of 2000 in a traditional classroom setting. Fifty-one percent of the 125 students who registered for the course, were male, 49% were female. Freshmen accounted for 40% of the enrollment, while 27% were sophomores and 23% juniors. Ethnically, 45% were Caucasian and 48% African-American. In terms of prior academic performance, 35% had grade point averages under 2.0, while 48% fell between 2.1 and 2.9, and 17% were at 3.0 or higher.

The course met four-and-a-half hours a week for 10 weeks and covered the following modules: keys to achievement, overcoming procrastination, building self-confidence, taking responsibility, learning from lecture, learning from text, preparing for exams, preparing papers and speeches, managing your life in school, improving relationships, and preparing for your

future. Students used a draft version of the textbook (*Learning & Motivation Strategies: Your Guide to Success*, Tuckman, Abry, & Smith, in press) that provided instruction in each area, and included in-class practice activities, and homework assignments for evaluation. After completing each module, students were given a quiz based on module objectives. Every two weeks, students turned for evaluation the assignments from the course textbook modules completed during that period, and a "portfolio" from each of the completed modules that required them to apply what they had learned in the modules to other courses they were taking. All instructional and evaluative components were based on the same set of strategies and substrategies described above.

To evaluate the effectiveness of the study strategies instruction, two dependent measures were examined: students' self-reports of techniques of value, and grade point averages. First, after completing the course, students were asked to identify specific techniques taught in the course, if any, they found useful, and describe their value. Second, students' grade point averages for the term in which they took the course were compared to their cumulative grade point average immediately prior to that term (that is, the overall GPA they had when entering the course).

Results and Discussion

Five specific techniques or strategies taught in the course were cited by a large percentage of students as particularly worthwhile. These were as follows: (1) techniques for overcoming procrastination, particularly the "to-do checklist" (cited by 42%); (2) techniques for test preparation, particularly the charts and diagrams (33%); (3) techniques for learning from text, particularly the "question and answer outline" (30%); (4) the entire "taking reasonable risk" strategy and its two substrategies: "go for goal" and "bite size pieces" (28%); (5)

techniques recommended for learning from lecture, particularly the notetaking and question writing approach (26%).

For the 92 students who remained in and completed the course with a passing grade, the comparison of their cumulative grade point averages entering the course (m=2.20, sd=.69) with their GPAs for the term in which they took the course (m=2.76, sd=.77) showed a highly significant difference of 0.56 (t=6.818, df=91, p<.001) in favor of the term in which the course was taken. This amounts to a substantial effect size of 0.71. When the GPA for the term in which the course was taken was recalculated for these students without including the grade for the course itself, the difference, while smaller (0.18), approached significance (p<.062).

The measure of GPA with the course grade included could be regarded as a measure of near transfer, since students were directly required to apply the strategies in the study skills course itself. The measure of GPA with the course grade excluded, may represent more a measure of far transfer, since students were also required, at least to a limited extent, to apply the strategies to other courses they were taking at the same time.

Clearly, earning a high grade in the course will elevate a student's GPA. However, a high grade requires students to do considerably more assignments and papers than a typical course, and also requires students to demonstrate mastery of the strategies and substrategies as applied not only to the content of the study skills course, but to other courses as well. Hence, the course contributes to grade point average improvement in multiple ways.

Moreover, it is not unreasonable to question the validity of the GPA with the course grade excluded as a measure of academic performance for the quarter. The median number of courses taken per quarter by first-year and second-year students is three, often including two required courses (e.g., mathematics and English) and the third an elective.. Eliminating the

elective course from the GPA and recalculating it using grades from only the two more conceptually difficult courses may not be an accurate representation of a student's overall performance.

In school terms subsequent to the one in which they took the course, there is considerably less assurance that students will continue to apply the strategies to achieve very far transfer. It does, however, lessen the value of the course if the strategies taught in the course are not subsequently used. However, if the strategies do not continue to be used, lower GPAs will reflect the value of the course, not necessarily the value of the strategies themselves. Subsequent evaluations will include follow-up of GPAs in later terms, with an effort made to measure self-reported continuation of strategy use as well. This will make it possible to relate strategy use over time to academic performance.

It was concluded that receiving the training in learning and motivation strategies provided by the course did indeed enhance student performance in college, most particularly in the nearest or most immediate sense, but also, although to a lesser degree, in a more broad or far sense.

## STUDY 2

### Methods

The second study differed from the first in two important ways. First, the second study utilized a comparison group, and second, while the content of the course remained the same, the manner in which the course was taught changed dramatically.

Participants in the second study were 37 students who completed the course during the Autumn of 2000. A control group of 37 non-course students was formed, by individually matching course takers on year of school, ethnicity, gender, and prior cumulative GPA. Eleven of the 37 students in each group were African-American, the remainder Caucasian.

Instead of instruction in a traditional class setting, the course was taught using a hybrid, web-based instructional model called Active Discovery And Participation thru Technology (ADAPT). The features of this model are as follows: (a) regular class attendance in a special-purpose computer lab is required; (b) new content is provided in the same textbook as before; (c) rather than listening to lectures, class time is spent working on computers, individually and in pairs to carry out and submit required performances, including computerized practice activities, assignments, and electronic discussions; (d) an instructor is always present – to provide individualized assistance. The instructional model capitalizes on the hands-on feature of web-based instruction, allowing students to actively complete most of their coursework (including "homework") in class, while providing the structure of a "classroom," including required attendance and a "live" instructor, to enable students to participate and perform in a timely manner.

The class, in its web-based format, has 176 learning performances, including quick-practices (exercises with automatic feedback), assignments (exercises with teacher feedback), applications (assignments done with a partner), self-surveys, self-assessments, module feedback forms, spotquizzes, course discussions, discussions on "A Hope in the Unseen" (a supplementary course reading), portfolios, and "Hope" papers. Performances in all but the last two categories can only be submitted electronically (into a database for grading and feedback), and only from the special lab in which the course is taught.

Results and Discussion

A two-way (2 x 2) analysis of covariance was run with GPA for the quarter in which the course was taken as the dependent variable, course versus no-course as the independent variable, ethnicity (African-American versus Caucasian) as the moderator variable, and prior cumulative

GPA as the covariate. The SPSS General Linear Equation model was used. As shown in Table 1, a significant main effect for course versus no-course ($F=5.285$, $df=1/69$, $p=.001$) and an interaction approaching significance between course/no-course and ethnicity ($F=3.589$, $df=1/69$, $p=.064$) were obtained. The main effect of ethnicity was not significant ($F=0.311$, $df=1/69$).

Mean scores and standard deviations on the dependent variable , GPA for the quarter the course was taken (adjusted for prior cumulative GPA), separated into course and no-course groups, and further by ethnicity, appear in Table 2. Overall, the course group earned an adjusted mean GPA of 2.84 in contrast to the adjusted mean of 2.25 earned by the matched no-course group. (In terms of gain scores, based on course-quarter GPA relative to prior cumulative GPA, students in the course group gained 0.68 GPA points in comparison to 0.18 for no-course students.)

Given that the interaction between course/no-course and ethnicity so closely approached significance ($p=.06$), a examination of the means for each of the two ethnic groups represented in the sample seemed appropriate. Caucasian students in the course earned an adjusted mean GPA for the course quarter of 2.73 compared to 2.45 for their counterparts not in the course, a benefit of 0.28. For African-American students, the benefit of the course is even more dramatic. African-American students in the course earned an adjusted mean GPA for the quarter of 2.94 compared to 2.04 for their counterparts not in the course, a benefit of 0.90. In terms of gain scores, Caucasian students in the course gained 0.59 GPA points in comparison to 0.31 GPA points gained by students not in the course. For African-American students, those in the course gained 0.76 GPA points while their non-course counterparts actually saw a decline of 0.06 GPA points.

It was concluded that taking the study skills course had a dramatic effect on students' GPAs relative to not taking the course. The effect size was .66. Much of this effect was due to the impact of the course on African-American students, whose course quarter GPA was almost a full point higher than the matched students not taking the course (an effect size of 1.32). Coming into the quarter with GPAs under 2.0, as many of the African-American students do, the course appears to give them the strategies and skills, coupled with the opportunity to apply effort, to achieve a high grade in the course. To the extent that these skills also transfer to other courses being taken concurrently, the result is a dramatic overall improvement in GPA. Again, follow-up studies of subsequent terms are needed to reach firm conclusions, but an auspicious beginning is a positive sign.

The major features of the course likely to be responsible for this improvement in academic performance are (1) a coherent set of four strategies and eight substrategies, all based on psychological research, across all topics covered in the course, and (2) 176 performances required of students, which constitute practice and assessment, provide feedback, facilitate transfer, and create the possibility for the development of new, functional behaviors. Subsequent research will focus on the contribution of each to the overall effect.

The results demonstrating the effectiveness of the course, while encouraging, are limited by the relatively small size of the sample, particularly of African-Americans. A similar evaluation will be done of the approximately 130 students taking the course in the Winter 2001 Quarter, in comparison to matched students not taking the course, to see if the results reported here will be replicated. In addition, the performance of students who participated in this evaluation will be examined for the Winter 2001 Quarter, the quarter after taking (or not taking) the course, to see if differences between groups persist beyond the time of the course.

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Table 1

Tests of Between-Subjects Effects on Current Quarter GPA

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. | Eta Squared |
|---|---|---|---|---|---|---|
| Corrected Model | 10.344 | 4 | 2.586 | 5.937 | .000 | .256 |
| Intercept | 7.591 | 1 | 7.591 | 17.430 | .000 | .202 |
| Prior GPA | 4.383 | 1 | 4.383 | 10.062 | .002 | .127 |
| Condition | 5.285 | 1 | 5.285 | 12.133 | .001 | .150 |
| Ethnicity | .135 | 1 | .135 | .311 | .579 | .004 |
| Condition * Ethnicity | 1.520 | 1 | 1.564 | 3.589 | .064 | .048 |
| Error | 30.053 | 69 | .436 | | | |
| Total | 526.132 | 74 | | | | |
| Corrected Total | 40.397 | 73 | | | | |

R Squared = .256 (Adjusted R Squared = .213)

Table 2

Descriptive Statistics for Current Quarter GPA (Adjusted By Cumulative Prior GPA)

| Course Or No-Course | Ethnicity | Mean | Std. Deviation | N |
|---|---|---|---|---|
| Course | Afr-Amer | 2.94 | .54 | 11 |
| | Caucas | 2.73 | .56 | 26 |
| | Total | 2.84 | .55 | 37 |
| No-course | Afr-Amer | 2.04 | .82 | 11 |
| | Caucas | 2.45 | .82 | 26 |
| | Total | 2.25 | .84 | 37 |
| Total | Afr-Amer | 2.50 | .82 | 22 |
| | Caucas | 2.59 | .71 | 52 |
| | Total | 2.57 | .74 | 74 |